

WHAT IS CLAIMED IS

1. An apparatus for interfacing a high-speed link to a network device, comprising:
a receiver module, operating at a first clock rate, for receiving a stream of in-coming data from the high-speed link;
a framer module, operating at a second clock rate, for deserializing the stream of in-coming data onto a multi-line bus and extracting data packets from the deserialized data on the multi-line bus,
wherein the second clock rate is lower than the first clock rate.
2. The apparatus according to claim 1, wherein the receiver module comprises optics and circuitry for receiving optical signals from a SONET OC-192 link.
3. The apparatus according to claim 1, wherein the receiver module comprises optics and circuitry for receiving optical signals from a SONET OC-768 link.
4. The apparatus according to claim 1, further comprising:
a sprayer module for receiving the extracted data packets from the framer module and transmitting each extracted data packet to one of a plurality of processing paths in the network device.
5. The apparatus according to claim 1, further comprising:

a sprayer module for receiving the extracted data packets from the framer module and transmitting each extracted data packet to one of a plurality of switching/forwarding module for processing.

6. The apparatus according to claim 1, further comprising:
a plurality of preprocessing modules for processing data packets; and
a sprayer module for receiving the extracted data packets from the framer module and transmitting each extracted data packet to one of the plurality of preprocessing modules.

7. The apparatus according to claim 6, further comprising a plurality of memories, each memory corresponding to one of the plurality of preprocessing modules,
wherein each preprocessing module comprises a memory management module for storing portions of data packets into its corresponding memory.

8. The apparatus according to claim 7, wherein the receiver module, the framer module, the sprayer module, the plurality of preprocessing modules, and the plurality of memories are mounted onto a single board.

9. The apparatus according to claim 7, wherein the receiver module, the framer module, the sprayer module, the plurality of preprocessing modules, and the plurality of memories are integrated onto a single chip.

10. The apparatus according to claim 1, further comprising:

a deframer module, operating at the second clock rate, for receiving data packets and processing the data packets into a stream of outgoing data for transmission on the high-speed link;

a transmitter module, operating at the first clock rate, for transmitting the stream of out-going data onto the high-speed link.

11. The apparatus according to claim 1, further comprising:

a desprayer module for receiving data packets from a plurality of processing paths and transmitting the received data packets to the deframer module.

12. An apparatus for interfacing at least one line interface card to a plurality of switching/forwarding modules of a network device, comprising:

a plurality of preprocessing modules for processing data packets and transmitting the processed data packets to respective switching/forwarding modules;

a sprayer module for receiving data packets from at least one line interface card and transmitting each received data to one of the plurality of preprocessing modules.

13. The apparatus according to claim 12, further comprising a plurality of memories, each memory corresponding to one of the plurality of preprocessing modules,

wherein each preprocessing module comprises a memory management module for storing portions of data packets into its corresponding memory.

14. The apparatus according to claim 13, wherein the plurality of preprocessing modules, the plurality of memories, and the sprayer modules are mounted onto a single board.

15. The apparatus according to claim 13, wherein the plurality of preprocessing modules, the plurality of memories, and the sprayer modules are integrated onto a single chip.

16. The apparatus according to claim 13, further comprising:
a desprayer module for receiving data packets from the plurality of preprocessing modules and outputting the received data packets to the line interface card.

17. A networking device, comprising:
a sprayer module for receiving data packets and outputting the received data packets on a plurality of channels;
a plurality of preprocessing modules for processing data packets, each preprocessing module receiving data packets from one of the channels of the sprayer module; and
a plurality of switching/forwarding modules, each switching/forwarding module receiving data packets from a corresponding one of the plurality of preprocessing modules.

18. The networking device according to claim 17, further comprising:

a framer module, operating at a first clock rate, for deserializing a stream of in-coming data onto a multi-line bus, extracting data packets from the deserialized data on the multi-line bus, and transmitting the extracted data packets to the sprayer module.

19. The networking device according to claim 18, further comprising:

a receiver module, operating at a second clock rate, for receiving a stream of in-coming data from a high-speed link and transmitting the stream of in-coming data to the framer module;

wherein the first clock rate is lower than the second clock rate.

20. The networking device according to claim 19, wherein the receiver module comprises optics and circuitry for receiving optical signals from a SONET OC-192 link.

21. The networking device according to claim 19, wherein the receiver module comprises optics and circuitry for receiving optical signals from a SONET OC-768 link.

22. The networking device according to claim 17, further comprising:

a desprayer module for receiving data packets on a plurality of channels, each corresponding to one of the plurality of preprocessing modules.

23. The networking device according to claim 22, further comprising:

a deframer module, operating at a first clock rate, for receiving data packets from the desprayer module and processing the data packets into a stream of out-going data for transmission on a high-speed link.

24. The networking device according to claim 23, further comprising:
a transmitter module, operating at a second clock rate, for transmitting the stream of out-going data onto the high-speed link,
wherein the first clock rate is lower than the second clock rate.

25. The networking device according to claim 24, wherein the transmitter module comprises optics and circuitry for transmitting optical signals onto a SONET OC-192 link.

26. The networking device according to claim 24, wherein the transmitter module comprises optics and circuitry for transmitting optical signals onto a SONET OC-768 link.

27. A method of receiving data from a high-speed link, comprising:
receiving a stream of data signals at a data rate of at least approximately 10 Gigabits per second;
deserializing the stream of data signals onto a multi-line bus;
extracting data packets from the deserialized data;
spraying the data packets across a plurality of processing paths.

28. A method of transmitting data to a high-speed link, comprising:
receiving data packets from a plurality of processing paths;
processing the data packets for transmission on the high-speed link;
serializing the processed data packets to form a stream of data signals;
transmitting the stream of data signals to the high-speed link.